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Individual Differences in the Generation and Processing of Performance Feedback

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In this paper, we identify domain-specific measures of individual differences in feedback propensities. In a series of studies, we identify the primary dimensions, psychometric characteristics, and construct validation evidence for internal ability, internal propensity, and external propensity for feedback. Confirmatory factor analysis supports the three-dimensional representation. Correlations between the new scales and existing differences of personality are consistent with theoretical predictions. Research that has used the new scales to predict feedback-related behavior and performance is described. Theoretical and practical extensions of the current work are discussed.

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Individual Differences in the Generation and Processing of Performance Feedback

The importance of performance feedback in maintaining and improving human performance has been long recognized and documented (e.g., Arps, 1917). Yet, as one moves beyond the simple admonition that "feedback is important," the issue of performance feedback in organizational settings quickly becomes very complex. What constitutes feedback? Where does it come from? How is it perceived? How is it processed? How does it impact recipients' performance, motivation or affective states? What about individual differences in the perception, processing, and reactions to various kinds of feedback? In this paper we propose the existence of individual differences in performance feedback propensities and present a series of studies in which we develop and validate measures of these propensities.

Starting with attempts at identifying different sources of feedback in organizations (Greller & Herold, 1975), the organizational behavior literature has pursued a variety of empirical and theoretical developments in attempts to answer some of the above questions. Preliminary models looked at feedback as a special case of a more general communication model (Ilgen, Fisher, and Taylor, 1979), considered control theory perspectives for understanding individuals' reactions to feedback (Taylor, Fisher, and Ilgen, 1984), and tried to investigate the various dimensions of feedback (Herold & Greller, 1977; Larson, Glynn, Fleenor, & Scontrino, 1987). How and why individuals might seek or avoid feedback has been studied (Ashford & Cummings, 1983), as well as the aspects of organizational environments which may convey feedback information (Herold & Parsons, 1985).

One area in which relatively little work has been done, however, concerns the role of the individual in the feedback process. Ilgen et al's (1979) model and review of early research alerted us to the fact that individual characteristics of the feedback recipient will

likely influence the perception, acceptance, and response to feedback. Shrauger and Rosenberg (1970) found self-esteem to be related to differences in individuals' responses to positive and negative feedback. Smith and Sarason (1975) found perceptual set, specifically social anxiety, to influence people's perception of the negativity of social feedback. Baron and Ganz (1972) found that subjects high in internal locus of control performed better under conditions of task-supplied feedback while high externals performed better under conditions of experimenter-supplied feedback.

The above-cited literature views the feedback recipient as passive, and focuses on individual differences as shaping perceptions of, and reactions to feedback. More recent feedback literature has viewed the performer as an active seeker and generator of feedback cues in the context of the organizational feedback environment (Ashford & Cummings, 1983; Ashford, 1986, Fedor, 1991). The notion that feedback information is a resource which the individual actively seeks or avoids, and even generates, raises interesting questions as to the likelihood that a given individual will engage in one or more of these feedback processes or behaviors.

If individuals are not simply passive recipients of feedback, but active solicitors, generators, and monitors of performance cues, then the "feedback" loop represented in most human performance models needs to be viewed as moderated by feedback-related individual differences. That is, performance and its consequences (including feedback "sent") does not fully determine the quantity or quality of the available feedback; rather, to the degree that individuals shape their feedback environment, quality and quantity of feedback will be influenced by the proclivities, predispositions, moods, and self-conceptions of the performer.

The thesis of this paper is that individuals differ in ways that are specific to performance feedback situations, and that such differences (if identified) would be valuable in better understanding the links between feedback, motivation, learning and performance. Toward this end, we report on a series of studies conducted to identify and

assess these individual differences and to study the psychometric properties of the resulting scales. The studies proceeded in two stages. The first stage, initial instrument development, had the goal of identifying a set of items that would reliably describe individuals' propensities to like, seek, and use feedback from different sources. Using multiple samples, this stage included item generation, exploratory factor analyses, confirmatory factor analysis, and estimates of internal consistency. The second stage had the goal of demonstrating appropriate levels of convergent and discriminant validity between these measures and other, theoretically related constructs, as well as demonstrating the utility of these scales for predicting behaviors of interest.

INSTRUMENT DEVELOPMENT

Twenty eight items were written to reflect liking for, confidence in, seeking of, and perceived utility of general performance-related impressions, cues, or incidents originating from either outside or within the individual (e.g., "I find that I am usually a pretty good judge of my own performance;" "I like getting frequent feedback from others concerning my performance"). It was thought that these items would define a single, bi-polar dimension anchored by a propensity to seek and/or value internally mediated feedback versus externally mediated feedback.

Method

Data were collected from 498 working individuals who expressed agreement or disagreement with the various items. The sample consisted of supervisory personnel from a public utility and various civil service organizations. Most subjects were male and their mean age was 37 years. The data were factor analyzed using a principal factors extraction with squared multiple correlations as the communality estimates, followed by Varimax rotation. A replication sample consisting of 80 employees from a military engineering and

testing facility was used to test the stability of the solution. Factors identified were interpreted, and items loading on factors were used to produce scales which formed the basis for further investigations into internal consistency and construct validity. For confirmatory analysis purposes, samples of 187 military helicopter pilot trainees and 87 graduate management students were used. Ninety-eight percent of the military sample was male and their mean age was 25.5 years. The graduate students had a mean age of 27 and 69% were male.

Results

In the sample of 498 supervisors, an eigenvalue greater than one criterion in conjunction with the scree test (Cattell, 1962) which looks for drop-offs in the plot of eigenvalues resulted in a three-factor solution for rotation and interpretation (rather than a one-factor solution, as hypothesized).

Table 1 shows the results of the rotated factors, factor loadings for each item, as well as the eigenvalues and percentage of variance explained by each principal factor. The following joint decision criteria were used for determining which items to retain for the purposes of factor definition and scale development: a) an item had to have an absolute loading greater than or equal to .30 on one factor, and b) that loading had to be .15 greater than the absolute value of that item's loading on any other factor so as to minimize cross-loading items. As Table 1 shows, the factor loadings matrix for the three factors approximates a "simple" structure, accounting for 66% of common variance.

Insert Table 1 about here

Factor Labels and Interpretations. The first factor is labeled *Internal Propensity*. The six items defining this factor reflect self-reliance, a lack of trust in others' evaluations,

and/or a preference for self-mediated feedback; they seem to describe a person with a generalized propensity to value internal feedback and to minimize the value of others' inputs. This factor also seems to have a strong self-image component, i.e., self-feedback seems to be a valued personal characteristic.

The second factor is labeled *Internal Ability*. The four items comprising this factor seems to indicate that regardless of whether or not one prefers internal feedback, the *ability* to self-assess, to know what is required in the way of performance, and to judge one's progress towards a performance goal is a separate issue.

The third factor is labeled *External Propensity*. This six-item factor reflects a preference for, a trust in, and a seeking of information about one's performance from external sources. Like *Internal Propensity*, these items seem to have a generalized self-image component (i.e., importance of how people view me and my work). However, more importantly, several items seem to reflect a lack of self-confidence concerning one's self-assessment rather than simply a preference for not self-assessing. This may explain why these items did not load negatively on the first factor.

Unit-weighting items loading on factors created three empirically defined scales having Cronbach alpha coefficients of .69, .63, and .59 for *Internal Propensity*, *Internal Ability*, and *External Propensity*, respectively. As would be expected, the two internal scales were positively related ($r=.31$), and both were negatively related to the external scale ($r=-.24$ and $r=-.38$).

Replication and revision of scales. In an attempt to improve the conceptual clarity and internal consistency of the three scales, two items were added to the *Internal Ability* scale (items 11 and 12 in Table 1) and two items were replaced in the *External Propensity* scales (items 17 and 18 in Table 1). The resulting 18 items were administered to the engineering and testing facility sample. The items were factor analyzed by the method described for the original sample, and closely replicated the earlier results. Loadings for new items ranged from .45 to .55 on the appropriate factor, with cross loadings no higher

than .22. Cronbach's alphas for this sample were: *Internal Propensity* (.70), *Internal Ability* (.81), and *External Propensity* (.83).

Confirmatory factor analysis. In order to test further the factor structure for the eighteen items in the revised scales, a confirmatory factor analysis was performed on the data obtained from the military pilot trainees and graduate management students using LISREL 7.16 (Joreskog and Sorbom, 1989).

The maximum likelihood estimation procedure of LISREL assumes multivariate normality and our items did not have normal distributions. We therefore followed the recommendation of Marsh and Hocevar (1988) to combine items that had similar content and were expected to load on the same factor. By pairing items as indicated in Table 2 and summing them, nine subscales resulted. The covariance matrix for these nine subscales was computed, followed by maximum likelihood estimation of parameters.

Because confirmatory analysis works well when testing *a priori* competing models, we estimated the parameters and goodness of fit for four different models. The first model, the null model, specifies no covariation among underlying factors and observed variables and its Chi Square value is used in the computation of other indices. The second model was a single factor model which represents the possibility that all items are the result of a single, bi-polar factor with external propensity at one end and internal propensity at the other end. The third model was a two correlated factor model representing the possibility that differences in external orientation and internal orientation were responsible for the item responses. The final, and hypothesized model, represented the construct as having the three correlated factors discussed earlier in the paper, *Internal Ability*, *Internal Propensity*, and *External Propensity*. Goodness of fit statistics used were the Chi-Square, the root mean squared residual (RMSR), the Normed Fit Index (NFI, Bentler and Bonet, 1980), the Parsimonious Normed Fit Index (PNFI, Mulaik, James, Van Alstine, Bennett, Lind, & Stillwell, 1989), and the Tucker-Lewis Index (Tucker & Lewis, 1973). These indices were chosen because they have been reviewed in the literature (Mulaik et al., 1989) and have

been used in confirmatory factor analyses (e.g. Drasgow & Kanfer, 1985; Harris, 1991; Marsh and Hocevar, 1988) which provides some basis for interpreting the obtained values. In addition, all proposed measurement model parameters were tested for differences from zero.

Because the results for both samples (pilot trainees and students) were so similar, they will be presented together. The goodness of fit tests confirm that the three correlated factor model is significantly better (Chi Square differences significant at .05 level) than the null model and the other hypothetical models (one and two factor). For the three factor model in the two samples, the RMSR was .07 and .06 respectively, the NFI was .87 and .86, the PNFI was .58 and .57, and the TLI was .89 and .96. All of these indices are consistent with a good fitting model, confirm the three factor model as better than the alternative models tested.

The loading matrices appear in Table 2. All factor loadings are statistically significant and the magnitudes of specific loadings are quite similar across the two samples. The factor intercorrelations are low enough to suggest that the dimensions are not so highly related as to be redundant. In both samples, improvements to the fit of the model could have been achieved by allowing non-zero cross-loadings of the subscales. There was some consistency between the two samples as to which subscales these would be. None of the internal ability subscales would be affected. Two of the three external propensity subscales would load on either internal propensity or internal ability. Although these cross-loadings might have achieved statistical significance, their estimated magnitude would still be quite small. We therefore conclude that the three correlated factors in Table 2 provides a meaningful, parsimonious fit to the observed subscales. Internal consistencies for the pilot trainees and student samples were, respectively, .70 and .74 for *Internal Propensity*, .69 and .74 for *Internal Ability*, and .72 and .76 for *External Propensity*. These findings corroborate the conclusions reached in the earlier, exploratory analyses.

Insert Table 2 about here

In summary, both the exploratory and confirmatory factorial solutions, using four widely different samples, point to the existence of three underlying dimensions describing people's reactions to internal and external feedback sources. These scales seem to have sufficient psychometric integrity to justify the further exploration of their construct validity.

VALIDATION STUDIES

Validity of the new scales was investigated in three ways. First, because the present dimensions are thought to measure individual differences, their empirical relationships to other individual differences should be shown to be theoretically consistent. Second, because these dimensions reflect people's predispositions towards different types of performance feedback, they should be correlated with other measures of the feedback environment in work organizations. Third, the utility of these scales in predicting behaviors of interest was tested.

Relationships with Other Individual Differences.

The following constructs were examined for their relationship to our new measures: Locus of Control, Self-Esteem, Public Self-Consciousness, Tolerance for Ambiguity, and Need for Achievement. Locus of Control (Rotter, 1966) was included to explore whether the newly developed scales are related to (or even redundant with) what may be the most widely used construct of an internal-external orientation in individuals. Predicting the nature of any relationship between the two constructs is problematical, however. On the one hand, we might anticipate a relationship because an internal orientation may generalize across the constructs (e.g. those high on internal locus of control would also see

themselves as capable of generating performance feedback and preferring it). But, on the other hand, because of the breadth of the locus of control construct, it might also encompass a propensity to seek externally generated information in order to better act on it. That is, a belief that one can control their destiny does not preclude the use of internal or external feedback in the process. Based mostly on the modest overlap in concept definitions, we anticipate a low to moderate positive correlation between *Internal Ability*, *Internal Propensity*, and internal Locus of Control.

Self-esteem was included because it had been shown by Schrauger & Rosenberg (1970) to be related to individuals' responses to different types of feedback. The self-competence implied by self-esteem should generalize to the perception that one is able to generate performance feedback, leading us to hypothesize a positive relationship between self-esteem and *Internal Ability*. Similarly, one would also expect a positive relationship with *Internal Propensity*, since *Internal Propensity* suggests a confidence in, or reliance on one's opinions of one's own performance, a concept closely linked to self-esteem.

Public self-consciousness, as conceptualized by Fenigstein, Scheier, and Buss (1975) reflects "the tendency to be aware of the publicly displayed aspects of the self, the self as a social object that creates impacts on other people." Our *External Propensity* measure is thought to reflect a heightened sensitivity to external cues and sources in one's environment, and thus could be expected to be positively related to the public self-consciousness measure. Conversely, this public self-consciousness should be negatively related to *Internal Propensity*, which reflects a reliance on internal cues, even to the rejection of external ones.

Tolerance for ambiguity, likewise, is thought to reflect an individual's willingness to operate in domains where problems are unstructured, information is insufficient, and cause-effect relations are uncertain. We anticipate that individuals who are high on *Internal Ability* and *Internal Propensity* would be higher in Tolerance for Ambiguity, and conversely, a higher tolerance for ambiguity would suggest less need for external feedback.

Finally, Need for Achievement, considered a "higher order" need, should be related to the need and ability to satisfy internal standards of performance, i.e., be positively correlated with *Internal Ability* and *Internal Propensity*. The prediction for External Propensity, however, is more problematical. One could hypothesize that high achievers are sensitive to, or eager for any performance-related cues which will shed light on their achievement (i.e., a positive correlation with *External Propensity*). However, to the degree that high achievers have developed internalized standards for assessing their own performance, they may be less externally reliant (i.e., negative correlations with *External Propensity*). The relationship may also be task or situation-dependent. In novel situations, high achievers may be more reliant on external cues, whereas in routine, or well-learned situations, they may be more internally reliant. Future explorations of these possibilities will need to provide greater insights into the directionality and strengths of these relationships.

In addition to the above-described conceptualizations of individual differences, Ghiselli's (1971) Self Description Inventory (SDI) was used to assess a variety of individual characteristics. The SDI assesses three ability measures (Supervisory Ability, Intelligence, and Initiative), five personality traits (Self-Assurance, Decisiveness, Masculinity-Femininity, Maturity, and Working Class Affinity), and five motivations (Need for Achievement, Need for Self-Actualization, Need for Power Over Others, Need for High Financial Reward, Need for Security).

Six SDI dimensions were used for making directional hypotheses. Initiative and Self-Assurance ought to be positively related to our two internal measures and negatively related to the *External Propensity* measure. Self-Assurance, more than any other SDI measure should be related to people's confidence that they can in fact self assess their own performance (*Internal Ability*), that they prefer to do so (*Internal Propensity*), and that they need not, or prefer not, to rely on external cues (*External Propensity*). Our general concept of "initiative" ought to follow the same general pattern; i.e., people exhibiting initiative are

thought of as being internally motivated, and not as motivated by, nor dependent upon externally provided cues. Need for Achievement (as already mentioned above) and Need for Self-Actualization are also thought of as "higher order" needs, and thus related to the satisfaction of some internal standards. As such, these needs ought to be positively related to our internal dimensions. Whereas for Nach we did not hypothesize a relationship with *External Propensity*, it seems that Self-Actualization would be negatively related to *External Propensity*. Whereas high achievers may use information from internal or external sources, self-actualization seems to imply self-generated feedback.

Maturity in an individual ought to be related to some self-understanding and a more accurate realization of one's relationship with one's environment. While this understanding does not imply that internal feedback is preferred (i.e., no hypothesized relationship to *Internal Propensity*), it seems to imply that one's ability to self-assess (*Internal Ability*) ought to be enhanced (positive correlation with *Internal Ability*). In addition, the lack of knowledge and assurance characteristic of immaturity should result in a tendency to search for external cues, leading to a negative correlation between maturity and *External Propensity*.

Finally, one SDI dimension, Need for Security, was hypothesized to be related to the feedback constructs in a manner opposite to those for maturity. Need for security, at least in organizational contexts, implies a concern with external performance cues since it is the sources of such cues (e.g., supervisor) who may determine one's future in the organization. A strong self-reliance for feedback information could endanger one's security if that feedback were not congruent with external sources' assessments of the individual's performance. Thus we hypothesized a negative relationship with the internal feedback scales, and a positive relationship with the *External Propensity* scale.

For the remaining SDI dimensions, no hypotheses were generated as there seemed to be no theoretically sound bases for making such predictions. Although some of these dimensions (e.g., Supervisory Ability) seem to be related to the processing of feedback

information, one could easily argue that either internally or externally mediated feedback could serve that purpose, depending on the individual's predisposition and/or situational variations. All hypothesized relationships for SDI scales including scales for which no predictions were made, are shown in Table 4.

Method. The relationships between the newly developed feedback propensity measures and the above-described individual differences were explored through questionnaire data obtained in multiple samples of college students, civilian, and military personnel. Because different samples were used to study different subsets of the above-described relationships, descriptions of the samples will appear in the tables where the specific results are reported, so as to minimize confusion.

Besides the SDI (Ghiselli, 1971), described previously, we used the following scales. Locus of Control was assessed with Rotter's (1966) scale and items from Collin's (1974) scales (those focusing on external, internal, and luck as loci of control). Based on factor analysis, this latter scale was reduced to a single dimension with higher scores representing a more internal orientation. To make it consistent with the Collins scales, the Rotter scale has been reverse scored such that higher scores represent a greater internal locus of control. Self-esteem was assessed with Rosenberg's (1965) scale and items from James and Jones (1980). Need for achievement was assessed through Ghiselli's (1971) SDI measure and items from Steers and Braunstein (1976). Because multiple scales exist in the literature for assessing locus of control, self-esteem, and need for achievement, we used different scales in different samples in order to examine the generalizability of our results. References to scales used in specific samples appear in the tables.

Tolerance for ambiguity was assessed with items from Norton's (1975) Measure of Ambiguity Tolerance (items from the problem-solving and job-related facets). Based on factor analysis, this scale was reduced to a single dimension with higher scores

representing a greater tolerance for ambiguity. Public Self-Consciousness was assessed with the Fenigstein, Scheier, and Buss (1975) scale.

Results. Table 3 shows correlations between the three feedback scales, Locus of Control, Self-Esteem, Need for Achievement, Tolerance for Ambiguity, and Public Self-Consciousness for multiple samples. For Locus of Control, most correlations were consistent across samples, of small magnitude, and generally non-significant. For the helicopter pilot trainees (Sample D), as predicted, we found a significant positive correlation between *Internal Ability* and internal Locus of Control. The obtained significant negative correlation between *External Propensity* and internal Locus of Control was not predicted.

Insert Table 3 about here

For Self-esteem, as hypothesized, correlations with *Internal Ability* were positive and fairly strong, ranging from .43 to .54 (all $p < .001$) across three samples. As hypothesized, Self-esteem also correlated positively with *Internal Propensity* (r 's from .19 to .21). For *External Propensity*, there was one significant negative correlation (-.29) and two very small non-significant correlations.

Correlations for Need for Achievement were .46 and .19 for *Internal Ability*, .14 and .29 for *Internal Propensity*; all in the predicted direction. The correlations with *External Propensity* were .23 and .18. These latter results support the idea suggested earlier that high need for achievers desire all performance cues, regardless of source.

The results for Tolerance for Ambiguity were also quite consistent across samples though not fully predicted from our earlier hypotheses. As predicted, the correlations with *Internal Ability* were positive ($r = .26$ and $.13$ with the first one being significant). The correlations with *Internal Propensity* were small and non-significant (not predicted). The

correlations with *External Propensity* were both significantly negative ($r = -.30$ and $-.33$) as predicted. This latter finding may shed further light on why some people are higher on *External Propensity*. They dislike ambiguity and seek inputs from others to help reduce uncertainty. Finally, as hypothesized, Public Self Consciousness was significantly negatively correlated with *Internal Propensity* ($r = -.39$) and significantly positively correlated with *External Propensity* ($r = .36$).

Table 4 reports the relationships between the three feedback scales and the SDI measures. The SDI data are divided into two parts in the table: those SDI scales for which relational predictions were made, and those for which no straight-forward predictions could be theoretically or intuitively made.

Insert Table 4 about here

As Table 4 shows, ignoring significance levels, 16 of 18 predicted relations using the SDI are in the hypothesized direction. Using the normal approximation to the binomial distribution, the probability of finding this many confirmations by chance is less than .001. Looking at those correlations which reached a significance level of .05 or better, we find that *Internal Ability* is positively correlated with Self-Assurance, Initiative, Need for Achievement, and Self-Actualization, while being negatively correlated with Need for Security (all as predicted; only the Maturity correlation failed to conform to the predictions). The correlations for *Internal Propensity* parallel those for Internal Ability in direction, but are considerably weaker, with only Self-Assurance and Need for Security being statistically significant and in the hypothesized direction. For *External Propensity*, while all the correlations were in the predicted direction, we find significant negative correlations with Initiative, Need for Achievement, and Maturity. The results for the SDI Need for Achievement scale were quite consistent with those reported in Table 3 using the Steers and

Braunstein (1976) scale. The only exception was a negative correlation with *External Propensity* using the SDI scale.

Finally, examining differences between correlations, we find five of the six *Internal Ability* correlations to be significantly different from their *External Propensity* counterparts (all except Maturity), as is the difference between the correlations of Need for Security with *Internal Propensity* and *External Propensity*. For the seven SDI dimensions which were predicted to be unrelated to the feedback scales, we find no significant relationships.

Overall, the results in Tables 3 and 4 show very good agreement with theoretical predictions and consistency across samples. This is important because it further embeds the new construct in a nomological net of meaning.

Relationships with Measures of Feedback Environments

Two types of data were collected to examine the relationship between the new measures and measures of the feedback environment. First, the "Feedback from the Job" and "Feedback from Agents" scales from the Job Diagnostic Survey (Hackman & Oldham, 1975) were used. If individual differences shape people's perceptions of job characteristics (e.g. O'Reilly, Parlett, & Bloom, 1980), then *Internal Ability*, and to a lesser degree, *Internal Propensity* should be related to the ability to glean performance information from the act of doing the work. Similarly, *External Propensity* might indicate a reduced awareness of, or attention to job cues, and a greater reliance on "agents." Thus we hypothesized a positive correlation between *Internal Ability* and Feedback from Job and a negative relationship between *External Propensity* and Feedback from Job.

For the Feedback from Agents measure the predictions are more difficult. If *External Propensity* indicates a desire for feedback from other people, this would suggest a positive correlation with Feedback from Agents. However, the relationship could be negative if such people feel these "agents" do not provide enough feedback. Similarly, those high in *Internal Ability* and *Propensity* may either not be as aware of feedback from

agents, or, they may be better able to use various cues from these agents to arrive at a self-assessment. Thus, additional work will be needed to sort out how the new feedback measures relate to the utilization of the available feedback.

Another exploration of associated measures of the feedback environment followed the work of Greller and Herold (1975) and Hanser and Muchinsky (1978). These researchers conceptualized the feedback environment as consisting of at least five separate sources of feedback information: a) the formal organization, b) one's supervisor, c) one's co-workers, d) one's own feelings and ideas, and e) the task itself. Since our Internal and External Propensity scales reflect a preference for one kind of feedback or another, one-item probes were used to ask respondents how much they like the opportunity to receive feedback from the five sources named above. It was hypothesized that *External Propensity* would be related to an expressed liking for organizational, supervisory, and co-worker feedback, while increased *Internal Propensity* would be related to decreased favorable reactions to these same sources but increased liking for "task" and "self" feedback.

Method The data for the JDS were collected for 228 multi-level managers from a variety of civil service organizations. Their average age was 45, and 94% were male. The expressed likings for different feedback sources were assessed using 50 public utility supervisors of whom 98% were male and whose average age was 36.

Results Table 5 shows the relationship between the new feedback measures and other conceptualizations of job performance feedback. As predicted, *Internal Ability* was positively correlated with reports of getting feedback from the job, while *External Propensity* was negatively correlated to such reports. The Feedback from Agents dimension, as predicted, was not as clear, i.e., *Internal Ability* was significantly positively related while *External Propensity* was not.

Insert Table 5 about here

For the data on people's liking for feedback from different sources, we find strong differences between the correlations for *Internal* and *External Propensity* with the three "external" feedback sources. *Internal Propensity* is negatively correlated with liking of feedback from organizations and supervisors, while *External Propensity* is positively correlated with the liking of the same sources, plus co-workers. Additionally, *Internal Ability* is significantly positively correlated with liking of feedback from self. Again, all these relationships support our interpretation of the three feedback propensity scales.

Predictive Study

In our final validation study, data were collected from students in order to use the three feedback propensity scales to predict systematic differences in the future behaviors of individuals. We expected that *Internal Ability* and *Internal Propensity* would predict behaviors that reflect attempts to generate one's own feedback while *External Propensity* would predict attempts to seek feedback from other people. Also, we expected that *Internal Ability* and *Internal Propensity* would be predictive of accuracy of self-assessments prior to the receipt of external feedback, while *External Propensity* would be predictive of accuracy after the receipt of external feedback.

Method. The scales were administered on the first day of class to undergraduate management students. Then, immediately upon completion of their first course examination (about 3 weeks later), students were asked to estimate their test score and submit it on a separate sheet. On the day that test scores were to be returned (one week later), the following steps were followed: a) students were asked to indicate whether they had gone back to their notes or textbooks to check on some of their answers (behaviors hypothesized to be related to *Internal Propensity* and *Internal Ability*), or whether they had discussed specific questions with classmates (a behavior hypothesized to be related to *External Propensity*), b) students were asked to again estimate their test score, c) students were provided a score distribution for their class, but still not their own scores, and asked

if they wished to revise their estimate in view of the aggregate data, and d) students received their score and were asked to enter it on the same form used for the above questions. This procedure yielded, in addition to the post-exam behaviors, three accuracy of self-assessment measures (immediately following exam, after the passage of one week, after receiving data about class distribution). Usable data for the various statistics ranged from 42 to 48. The sample was 67% male, with a mean age of 22.

Results. The results are shown in Table 6. Of the two "internal" behaviors thought to be associated with the internal scales (going back to notes and textbook), only *Internal Ability* was significantly positively related to going back to class notes. *External Propensity*, contrary to expectations, was negatively related to discussion of test answers with fellow students.

For the accuracy data we find interesting results. While there is no relationship between accuracy of self-assessments of performance immediately after the test and any of the feedback dimensions, one notes that *Internal Ability* is significantly positively related to accuracy of the self-assessments after one week of reflection, and the strength of this relationship remains the same after aggregate data for the class are presented. However, *External Propensity*, which is *unrelated* to self-assessments after the same one week of reflection, is significantly positively related to self-assessments *following* the presentation of class-wide data (externally provided feedback). Thus it seems that our *Internal Ability* construct is related to the actual ability to assess one's performance given the apparent lack of external cues, while the *External Propensity* construct is shown to be related to more accurate self-assessments once external cues are provided.

Insert Table 6 about here

Summary.

Our attempts to validate the constructs underlying the new scales were very encouraging. The data reported in Tables 3 and 4 showed that the meaning we had attached to our empirically derived dimensions were consistent with the empirical relations found between these dimensions and other researchers' measures of personal characteristics. Again, we found positive and negative relationships where expected, we found no relationships where none were expected, and perhaps most importantly, there were no unexplainable, theoretically problematical, or inconsistent relationships. Furthermore, the wide differences in relationships and their patterns found in Table 3 and 4 argue against a "common methods variance" explanation for the results.

While one may be tempted to say that the relationships for the external scale are obviously the inverse of those for the internal scales, it should be remembered that the scale intercorrelations were quite low across several samples, suggesting that the three scales are relatively independent; also, while the *Internal/External Propensity* measures were more likely to represent inverse relationships, the greatest differences were between the *Internal Ability* and the *External Propensity* measure. These scales were also shown to be unique in the sense of not simply representing a generalized internal-external orientation as does the Locus of Control construct.

The new measures' validities were also supported by correlational studies using other researchers' conceptualizations of feedback. The results suggest that reports of job characteristics are influenced by individual differences, with *Internal Ability* being related to reporting of greater feedback from the job, while *External Propensity* is related to reporting less feedback from the job. This suggests that what is often treated as measurement error accounting for variance in such self-reports may be better treated as systematic differences in perceptions affected by individuals' preferences and ability to give self feedback. Furthermore, it was shown that the new measures were theoretically consistent with people's reports of liking for feedback from different sources.

The relationships between these new scales and other, non-performance related scales assessing aspects of the "self" suggest that self-esteem is a component in the expressed ability to self-assess. The propensity for external feedback was positively related to Public Self-Consciousness, which in turn was negatively related to *Internal Propensity*. These findings are also theoretically consistent.

Finally, two of the three new measures were shown to be predictive of actual behaviors (i.e., self-assessments of performance) in a theoretically consistent fashion. The data support the notion that *Internal Ability* does, in fact, reflect the ability to know how well one has done, without others telling one, while *External Propensity* did predict a greater utilization or internalization of externally provided feedback, with a resulting improvement in one's self-assessment. These findings are encouraging given the importance which is generally attached to people's ability to utilize performance-related cues for the purposes of self-assessment, self-regulation, and performance modifications.

GENERAL DISCUSSION

This paper began by arguing that organizational behavior models of the performance feedback process explicitly acknowledge the role of individual differences, but that there has been little or no effort to develop a conceptualization of what this means. A proactive view of the performer as a shaper and manipulator of the feedback environment requires that we allow for individual differences in such shaping or manipulating.

Our explorations resulted in the emergence of a three-factor structure consisting of an *Internal Ability*, *Internal Propensity*, and *External Propensity*. *External Propensity* reflects the preference for externally-mediated feedback, as well as greater trust in such information over that which the individual may provide themselves. *Internal Propensity* reflects the opposite preference structure, but also suggests the tendency to reconcile differences between internal and external feedback in the direction of the internal. *Internal*

Ability seems to distinguish between the preference for internal feedback and the perceived ability, or confidence to actually, or accurately generate such feedback. The integrity of this interpretation held up in a confirmatory analysis of two, widely different samples.

Construct validity attempts focused on discriminant and convergent validity demonstrations using previously researched measures of individual differences. Overall, these results were very strong, indicating both positive and negative relationships where those would be expected and no relationships where none would be expected. Only a few hypothesized relationships turned out weaker than hypothesized. No theoretically inconsistent relationships occurred which would question the construct validity of the new measures. Finally, nothing in the data suggested that the new measures are redundant with any existing measures.

Our results suggest that *Internal Ability* has a fairly strong association with self-esteem implying that self-worth, and perhaps self-efficacy, may be important correlates or determinants of *Internal Ability*. In addition, *Internal Ability* is also related to need for achievement, initiative, and self-assurance. As we try to better understand how these global traits might influence learning, performance, and motivation, we can speculate that their linkage to these outcomes might be mediated through the belief that one can generate valid feedback. The confidence that one "can figure it out for themselves" or make corrections before they go too far down the wrong path means that they are less likely to be intimidated by (or perhaps even enjoy) new situations, situations with greater uncertainty, and so on. The high *Internal Ability* person also sees more feedback coming from their jobs and likes it more than that coming from other people. This implies that jobs that provide more independence from the scrutiny of others may be particularly well suited for the high *Internal Ability* person.

Internal Propensity has much the same pattern of correlations as *Internal Ability* (though of lower magnitude) with more global individual differences of self esteem, need for achievement, and self-assurance. *Internal Propensity* did have a negative correlation

with public self consciousness, suggesting a lack of concern for how one appears to other people. Furthermore, more difference in correlations between the two internal scales appeared when the scales were correlated with perceptions and affective reactions to feedback sources. Here, it appears that *Internal Propensity* was associated more with a negative reactions towards external social sources (organization, supervisor, and co-workers) than was *Internal Ability*, which was positively associated with positive reactions towards non-external sources of task and self. The fact that the two internal scales tended to be related to the same global individual differences, yet have different correlations with perceptions and affective reactions towards possible feedback sources further supports the distinction between the "ability" and "propensity" for internal feedback.

External Propensity had a pattern of correlations with the global individual differences that appears to be the opposite of those for *Internal Ability* and *Internal Propensity*. There was also consistent evidence of a negative association with tolerance for ambiguity. This latter result, in conjunction with the positive affective reactions towards external feedback sources (organization, supervisor, co-workers), all suggest a tendency to prefer situations where structure *and* other people are available to assist in learning, motivation, and performance. The lack of negative correlations with affective reactions towards internal sources further substantiates the interpretation that *External Propensity* is not a rejection of internal sources, but a valuing of external sources.

Overall, the ability of our measures to show these patterns of relationships in very encouraging. The small predictive validity study further indicates that these measures may have utility for studying a variety of important behaviors in various performance settings.

The identification of these three predispositions may open several important research avenues. First, for those doing research which presumes the individual to be an active participant in the feedback process, these measures will allow more direct assessment as to who is likely to be thusly involved, and/or the likely nature of their proactivity. That is, are some people more or less likely to self-generate feedback, or seek

it from others, or construe events in terms of their feedback potential? The answers to these questions would be important in determining possible good or bad fits between different people and different feedback environments (cf. Herold & Parsons, 1985).

These measures could also shape the design and delivery of feedback systems in training or other performance situations. For example, self-instruction, or computer-based instruction may turn out to be more appropriate for "internals" than "externals." The latter may do better in settings in which an external agent (e.g., instructor, peers) is present. Without getting into the self-task distinction to argue about where "internal" ends and "external" begins, it seems that internals would do better where the self-task complex is the primary source of performance-related information, whereas externals would perhaps find this to be a feedback-poor environment.

Finally, these feedback propensity constructs could be used to investigate models or theories of self-regulation. These models typically specify self-monitoring and self-assessment of performance as central to the self-regulation process. Our research suggests that individuals may differ in their propensity and ability to self-monitor and/or self-assess. Such differences may become very important in situations where external feedback agents are not readily available, such as in novel situations (e.g., during organizational transitions), or when performing a task in isolation (e.g., flying a plane).

The new measures may also be helpful for those studying the development and role of various global and domain-specific self-perceptions. Perceptions of self-esteem, self-competence, or self-efficacy are clearly shaped by the quantity and quality of feedback one receives about performance. If people differ in their attention to, or utilization of different feedback types, mechanisms, or channels, then one would expect differential effects of feedback upon the various self-perceptions.

Finally, for those investigating the effects of more global self-perceptions or predispositions in performance settings, the present measures may allow for more "mid-range" theorizing, i.e., theorizing which uses variables which are more closely linked to

the performance concepts of interest. Instead of using standard, "off the shelf" individual difference measures, perhaps researchers can utilize those which are likelier to be related to behaviors in performance settings, and thus, more likely to demonstrate relationships of interest.

One of the strengths of the current findings is that they were achieved in multiple samples with several iterations of item writing. The samples were diverse and represented a variety of organizational settings including civil service, military, utility, education, and recreation. Thus, generalizability should be strong.

Although the coefficient alphas for the new scales were usually in the acceptable range, longer scales might improve reliability and hence improve future theory testing. Some extensions of the scales to incorporate possibly different predispositions for negative versus positive feedback should also be undertaken, as should studies which continue to investigate whether sub-scales might best represent conceptual differences which may currently reside in a given scale.

Of course, ultimately, any measures will need to prove their worth either by explaining variance in behavior not otherwise explained, by showing their ability to cause or predict situational or ability variables which, in turn, predict behavior, or to be useful as dependent variables. We believe that the next research phase for these scales will be to study them in predictive situations so as to more fully understand their meaning.

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Table 1

Results of Factor Analysis of Preliminary Feedback Propensity Items

Factors and Items	Factor Loadings		
	I	II	III
<u>Factor I: Internal Propensity</u>			
1. As long as I think that I have done something well, I am not too concerned about how other people think I have done.	.50	.22	-.02
2. How other people view my work is not as important as how I view my own work.	.49	.11	-.09
3. If you think you have done something well, don't let other people's opinions to the contrary get you down.	.38	.12	.09
4. People ought to be more concerned with their self-image than with what other people think of them.	.44	-.04	-.11
5. What I think of myself and my work is more important to me than what others think.	.48	.06	-.06
6. It is usually better not to put much faith in what others say about your work, regardless of whether it is complimentary or not.	.33	-.05	.04
<u>Factor II: Internal Ability</u>			
7. If I have done something well, I know it without other people telling me so.	.13	.49	.06
8. I usually have a clear idea of what I am trying to do and how well I am proceeding toward my goal.	.00	.52	-.06
9. I find that I am not very good at assessing my own performance, and need to rely on the inputs of others.	-.15	-.63	.19
10. I find that I am usually a pretty good judge of my own performance.	.14	.51	.04
<u>Factor III: External Propensity</u>			
11. It is very important to me to know what people think of my work.	-.28	-.05	.49
12. It is a good idea to get someone to check on your work before it's too late to make changes.	-.08	-.10	.34
13. I like getting frequent feedback from others concerning my performance.	-.13	.06	.30
14. Even though I may think I have done a good job, I feel a lot more confident of it after someone else tells me so.	-.12	-.18	.58
15. Since one cannot be objective about their own performance, it is best to listen to the feedback provided by others.	-.13	-.14	.38
16. Even when I think that I could have done something better, I feel good when other people think well of what I have done.	.01	.01	.41

Table 1 (Continued)

Results of Factor Analysis of Preliminary Feedback Propensity Items

Factors and Items	Factor Loadings		
	I	II	III
Items Not Used in Original Scales			
I am the best judge of my own work.	.38	.39	.05
It is very important for me to know what people think of my work.	-.40	.09	.37
I tend to be my own worst critic.	.23	.10	-.07
I dislike teachers who delayed in returning exams.	.06	-.01	.18
I tend not to form strong impressions about my work, one way or the other, until I get some confirmation from others on whether I have done well or not.	.06	-.24	.09
If I have done something poorly, I know it without other people telling me so.	.06	.24	-.01
Receiving a grade or a score (such as one a test) isn't very helpful unless you know how other people have scored.	.10	-.12	.21
I frequently seek others' reactions to my work.	-.13	.06	.19
Even though others think well of something I have done, I am not happy if I have not met my own standards.	.09	.20	-.04
If one only had a clear picture of what they had to do, they would be able to tell how they are doing it.	.05	.13	.15
In most situations people just won't tell you how they think you are doing.	.15	-.11	.23
I am not always sure how people expect me to perform; this makes it difficult to gauge how well I am doing.	.04	-.28	.27
Eigenvalue	2.57	1.37	1.21
Percent of Variance Explained	33.1	17.7	15.7

Subsequently, the following items were added to the Internal Ability scale:

17. When I finish something, I can usually tell right away whether I did it well or not.
18. When I finish a job or project, I give some thought to how well I did, even if I can't change things at that point.

Subsequently, the following items were substituted for items #12 & 15 in External Propensity scale:

19. I don't like going for long periods of time without getting feedback concerning performance.
20. I like being told how well I am doing on a project.

Table 2
Loading Matrix From Confirmatory Factory Analysis

Subscale	Pilot Trainees			Students		
	<u>Internal Propensity</u>	<u>Internal Ability</u>	<u>External Propensity</u>	<u>Internal Propensity</u>	<u>Internal Ability</u>	<u>External Propensity</u>
INTPRO1 (Items 4 & 6) ^a	.64*			.61*		
INTPRO2 (Items 1 & 3)	.77*			.88*		
INTPRO3 (Items 2 & 5)	.45*			.51*		
INTABL1 (Items 8 & 18)		.61*			.44*	
INTABL2 (Items 9 & 10)		.66*			.65*	
INTABL3 (Items 7 & 17)		.61*			.86*	
EXTPRO1 (Items 14 & 20)			.64*			.73*
EXTPRO2 (Items 13 & 15)			.74*			.70*
EXTPRO3 (Items 16 & 19)			.61*			.70*

Factor Inter correlations

	Pilot Trainees			Students		
Internal Propensity	1.00			1.00		
Internal Ability	.62*	1.00		.49*	1.00	
External Propensity	-.27*	.11	1.00	-.17	-.20	1.00

*P < .05

^a Items from Table 1 which were combined into subscale for purposes of confirmatory analysis

Table 3

Correlations of Feedback Propensity Scales
with Other Individual Differences

Variable	Sample	Measure	Internal Ability	Internal Propensity	External Propensity
Locus of Control	B	Rotter (1966)	-.19	.16	.20
	D	Collins (1974)	.15*	.12	-.18*
	E	Collins (1974)	-.07	-.13	-.05
Self Esteem	A	James & Jones (1981)	.52***	.21*	-.01
	D	Rosenberg (1965)	.54***	.20**	.02
	E	Rosenberg (1965)	.43***	.19	-.29**
Public Self Consciousness	C	Fenigstein, et al (1975)	-.05	-.39*	.36*
Tolerance for Ambiguity	D	Norton (1975)	.26***	-.07	-.30***
	E	Norton (1975)	.13	-.08	-.33***
Need for Achievement	D	Steers & Braunstein (1976)	.46***	.14*	.23**
	E	Steers & Braunstein (1976)	.19	.29**	.18

A N = 115 amusement park workers; 55% female; mean age = 19.

B N = 43 public utility managers; all male; mean age = 36.

C N = 99 undergraduate management students; 67% male; mean age = 22.

D N = 187 helicopter pilot trainees; 98% male; mean age = 26.

E N = 87 graduate management students; 69% male; mean age = 27.

*p < .05

**p < .01

***p < .001

Table 4

Correlations of Feedback Propensity Scales with SDI Scales

	Internal	Ability	Internal Propensity	External Propensity
<u>SDI Scales with predictions</u>				
Initiative	(+)	.21*	(+) .08	(-) -.20
Self-Assurance	(+)	.43**	(+) .20*	(-) -.17
Maturity	(+)	-.13	(+) -.06	(-) -.20*
Need for Achievement	(+)	.30**	(+) .04	(-) -.22*
Self-Actualization	(+)	.23*	(+) .16	(-) -.17
Need for Security	(-)	-.28	(-) -.29*	(+) .15
<u>SDI Scales with no predictions</u>				
Supervisory Ability		-.03	.09	-.10
Intelligence		-.03	.13	-.18
Decisiveness		-.07	.19	.09
Masculinity-Femininity		-.17	.09	.07
Working-Class Affinity		-.11	-.06	.16
Need for Power		-.09	.10	-.14
Need for Financial Reward		-.07	.01	.01

Notes: Signs in parenthesis indicate directional prediction made.

N = 72 public utility managers; all male; mean age = 36.

*p < .05

**p < .01 all tests 1-tailed.

Table 5
Relationship of New Scales to Other
Conceptualizations of Feedback

Conceptualization	Internal Ability	Internal Propensity	External Propensity
<u>JDS^a</u>			
Feedback-Job	.36***	.08	-.22***
Feedback-Agents	.19**	-.04	-.05
<u>Affective reaction to feed- back from different sources</u> ^b			
Organization	.08	-.26*	.25*
Supervisor	.05	-.37**	.55**
Co-Workers	.16	-.12	.26*
Task	.20	-.01	-.02
Self	.39**	.17	.01

^aN = 228
^bN = 50
 *p < .05
 **p < .01
 ***p < .001

Table 6

Relationship of Feedback Scales to Post-Test Behaviors
and Accuracy of Self-Assessments of Performance

	Internal Propensity	Internal Ability	External Propensity
<u>Behaviors</u>			
Review class notes to check on answers.	.19	.29*	.04
Review textbook to check on answers.	-.05	.01	.20
Discuss questions and answers with classmates	.15	-.01	-.26*
<u>Accuracy of self-assessments</u>			
Immediately after test	-.20	-.04	.07
One week later	-.10	.30*	.16
After viewing grade distribution	.01	.27*	.37**

N's range from 42 to 48

* $p < .05$

** $p < .01$